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Word Learning Ability is Correlated with Phonological Working Memory Improvement after Temporal Lobe Resection

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Introduction

We report word learning ability of an 18-year old woman before and after the resection of a large part of her left temporal lobe to remove a tumor. The tumor extended from the middle and inferior temporal gyri and into the insula. Direct electrical cortical language mapping took place during awake-craniotomy in order to localize and spare necessary speech areas of the cortex. The patient was tested, before, immediately after surgery, and 6 months post-operatively in a variety of verbal learning tasks including lists of words, proper names and short stories, in addition to a variety of word production tasks (picture naming: Boston naming test, Snodgrass & Vanderwart (1980), and verbal fluency). She was also tested in a number of working memory tasks tapping the phonological, the visual and visuo-spatial, and the central executive components of working memory as described by Baddeley (1986). Her performance was compared to that of a group of 10 age- and education-matched control subjects who underwent the same testing procedures. There is considerable evidence that working memory plays a crucial role on new word learning (Baddeley, Gathercole & Papagno 1998; Gathercole, 2006). Word learning has also been associated with improvement of word production (Martin and Gupta, 2004).

Results and Discussion

Overall, her performance remained abnormal in all word production tasks. However, she improved significantly in all verbal learning tasks achieving normal controls' performance in some of them such as the paired associate learning task and the lists of words and proper names tasks. Improvement in verbal word learning correlated only with improvement in working memory tasks such as nonword list recall, word list matching, digit backward and digit span under articulatory suppression. We conclude that the ability to learn words is closely linked to temporary phonological storage (Gathercole, 2006). Working memory seems to give a unique contribution to new word learning and this was not correlated with word production abilities which remained impaired before, immediately after surgery, and 6 months post-operatively.

References

1. Baddeley, A. D., Gathercole, S. E., & Papagno, C. (1998). The phonological loop as a language learning device. *Psychological Review, 105 ,* 158-73

2. Gathercole, S. (2006). Complexities and constraints in nonword repetition and word learning. *Applied*

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Psycholinguistics, 27, 599-613.

3. Martin, N. & Gupta, P. (2004). Exploring the relationship between word-processing and verbal short-term memory: Evidence from associations and dissociations. *Cognitive Neuropsychology, 21*, 213-228.

4. Snodgrass, J. G., & Vanderwart, M. (1980). A standardized set of 260 pictures: Norms for name agreement, image agreement, familiarity, and visual complexity.*Journal of experimental psychology.Human learning and memory, 6*, 174-215.